I. Project Title: **Abundance Estimates for Colorado pikeminnow in the Middle Green River /Yampa River System**

II. Principal Investigator(s):

Kevin Bestgen/ John Hawkins/ Gary White
Department of Fishery and Wildlife
Colorado State University
Ft. Collins, CO 80523
voice: KRB (970) 491-1848,
JAH (970) 491-2777
fax: (970) 491-5091
email: *kbestgen@picea.cnr.colostate.edu, jhawk@lamar.colostate.edu*, *gwhite@cnr.colostate.edu*

Ron Brunson
Utah Division of Wildlife Resources
152 East 100 North
Vernal, Utah 84078
voice: (435) 781-5315
fax: (435) 789-8343
email: *nrdwr.rbrunson@state.ut.us*

Tim Modde and G. Bruce Haines
U. S. Fish and Wildlife Service
266 West 100 North, Suite 1
Vernal, Utah 84078
voice: (435) 789-0354 X-12
fax: (435) 789-4805
email: *tim_modde@fws.gov*

Thomas P. Nesler
Colorado Division of Wildlife
317 West Prospect
Fort Collins, CO 80524
voice: (970) 472-4384
email: *tom.nesler@state.co.us*

III. Project Summary:

Sampling conducted during this project will obtain capture-recapture data needed to estimate abundance of Colorado pikeminnow *Ptychocheilus lucius* in the mainstem Green River upstream of the White River and its tributaries including the Yampa, White, and Duchesne rivers. Abundance estimates of endangered Colorado pikeminnow are needed to better monitor population status and provide benchmarks against which progress toward recovery can be measured. Work started in the spring of 2000 with three different agencies, each responsible for sampling a river and will conclude in 2002. Our primary goal was to capture and mark as many Colorado pikeminnow as possible on each river during at least three different sampling occasions. Fish were marked with uniquely numbered tags (PIT tags) inserted into the body cavity each fish. The U.S. Fish and Wildlife sampled the White River, Utah Division of Wildlife Resources sampled the Green and Duchesne rivers, and Colorado State University sampled the Yampa River. Each river was sampled in a downstream direction. Sampling occurred during spring runoff and ended before pikeminnow spawning migration. Electrofishing was the primary sampling gear but was supplemented with trammel and fyke nets. In 2000, a total of 1151 Colorado pikeminnow captures were recorded, including 386 capture events of fish previously tagged. In 2001, a total of 770 Colorado pikeminnow captures were recorded, including 80 capture events of fish previously handled in 2001 (Table 1).

IV. Study Schedule: Initial Year 2000
Final year 2002

V. Relationship to RIPRAP *(Version: March 8, 2000)*:
General Recovery Program Support Action Plan:

V.	Monitor populations and habitat and conduct research to support recovery actions (Research, monitoring, and data management).
V.A.	Measure and document population and habitat parameters to determine status and biological response to recovery actions.
V.A.1.	Conduct Standardized Monitoring Program.
V.A.1.a.	Evaluate and refine procedures periodically, as appropriate. (With emphasis on expanding ISMP to monitor response of fish community and endangered fishes to major recovery actions.)
V.B.	Conduct research to acquire needed life history information.
V.B.1.	Identify significant deficiencies in life history information and needed research (will come partially from IMOs).
V.B.2.	Conduct appropriate studies to provide needed life history information.

VI. Accomplishment of FY 2001 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Task 1.	Feb.-March.	Literature research, order and prepare equipment, develop standard protocol for field crews.
Task 2.	April.	Scout locations, final equipment preparation.
Task 3.	Apr.-June.	3-pass sampling.
Task 4.	September.	Sample appropriate canyon reaches to evaluate fish movement.
Task 5.	Jan.-Sept.	Sampling team coordination, data entry, and analysis.
Task 6.	December.	Write Recovery Program summary report.

Most tasks were met in year 2001. A discussion by agency teams refined the methodology and the Standard Operating Procedure Manual. The Manual provided an overview of the work, the sampling approach, endangered fish handling and tagging procedures and standardized data forms. Periodic updates among crews during the sampling period allowed an adaptive and refined approach to sampling (Tasks 1 & 5). Crews had to conduct reconnaissance of remote river reaches to find boat launch and take-out sites and had to obtain permission to access some sites on private property. In addition, all three crews had to equip and rig new equipment specific for the sampling approach (Task 2). The most effective design was systematically sampling both shorelines with electrofishing gear and supplemental block and shock sampling in off-channel areas. Three sampling passes were completed in the White River and four were

completed in the Green and Yampa rivers in 2001. We need to further evaluate the usefulness of captures for abundance estimation from the last pass conducted on each river system because of the possibility of fish movement out of some reaches. We will determine if Colorado pikeminnow started their spawning migration based on declining capture rates and sexual condition of fish when captured.

Sampling occurred mid-April through mid-June (Task 3, Table 1). Electrofishing effort included 253 hours on the Green River, 204 hours on the White River, and 174 hours on the Yampa River. Electrofishing effort was more equal on all rivers this year because two electrofishing boats were used in all reaches, whereas only one was used in the Yampa River in 2000. Yampa River sampling again included fyke and trammel net samples of backwaters and flooded tributaries (Table 1). Total Colorado pikeminnow captured in all passes was 394 (n = 738 in 2000) from the Green River, 236 (n = 320 in 2000) from the White River, and 140 (n = 93 in 2000) from the Yampa River. Also captured were 84 razorback sucker from the Green River, most of those in the reach from Split Mountain to Jensen. Recaptures of Colorado pikeminnow in 2001 from the Green, White, and Yampa were 36 (n = 254 in 2000), 24 (n = 91 in 2000), and 20 (n = 41 in 2000) respectively. Recaptures reported for 2001 include only fish handled in prior sampling passes in 2001 whereas totals in 2000 included fish captured during the same sampling pass, fish captured during previous passes, and fish captured in previous years. Abundance estimates will be based only on recaptured fish that were marked during previous sampling passes in each year.

All data reported here are preliminary and subject to change after all data forms and data files are scrutinized for errors and clarified.

The primary shortcoming during this field season was Task 4. Sampling of canyon reaches was planned to estimate the number of fish that were not available for capture in other more accessible sampling reaches. Low flows occurred very early in 2001 which precluded sampling in those reaches. We will formulate a new plan in January 2002 and present it to the Program Directors office and the Biology Committee.

Prior to final data analysis and development of abundance estimates, we need to establish a firm definition of what we and the Program considers the length of an adult Colorado pikeminnow to be included in estimates of adult fish abundance. This issue was discussed at the Abundance Estimation Workshop held in Fort Collins, CO in December 2001 but was never resolved. This issue is important because abundance levels defined in Recovery Goals are for adult fish of a ceratin length or age. Resolution of this issue will ensure that abundance estimates are calculated using the correct length- or age-group of fish.

VII. Recommendations:

Adaptive changes were made to increase the efficiency and capture rates of Colorado pikeminnow in 2001 compared to 2000. Those same 2001 methods will be implemented in 2002 sampling.

VIII. Project Status:
This project will continue in 2002 and should be considered "*On Track and On-going*".

IX. FY 2001 Budget Status

A. Funds Provided: $148,200
B. Funds Expended: $117,700.
C. Difference: $30,500, $22,500 for canyon sampling and $8,000 data analysis and data verification costs remain.
D. Percent of the FY 2001 work completed, and projected costs to complete: about 90% completed, no additional funds needed.
E. Recovery Program funds spent for publication charges: None

X. Status of Data Submission (Where applicable):

PIT Tag data files will be submitted by individual agencies (USFWS, UDRW, and CSU) by January 2002.

XI. Signed: *John Hawkins and Kevin Bestgen* 12-11-2001
Reporting Principal Investigator Date

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Attachment: Table 1.

Table 1. Sampling dates and effort middle Green/ Yampa population of Colorado pikeminnow. These data are preliminary and subject to change.

	Dates	Days Sampled	River Miles Sampled	Total Effort (hours)			Number of Pikeminnow Captured [1]	Number of Pikeminnow Recaptured [2]
				Trammel /Electro-fishing	Fyke Nets	Electro-fishing		
Green River								
Trip 1	April 16 - 24	9	332-256	0		45.41	64	
Trip 2	May 1 - 11	11	334-245	0.08		68.59	87	
Trip 3	May 14-May 24	11	334-245		7.15	80.53	158	
Trip 4	May 29 - June 6	9	334-246		7.25	58.52	85	
Totals		40		0.08	14.4	253.05	394	36
Yampa River								
Trip 1	April 24 - May 2	9	119-46	0.42		49.32	51	
Trip 2	May 11 - 19	9	119-46	1.07	87.23	45.69	36	
Trip 3	May 27- June 4	9	119-46	1.13	141.66	38.34	44	
Trip 4	June 12 - 19	8	119-46	0.33	50.41	40.85	9	
Totals		35		2.95	279.3	174.2	140	20
White River								
Trip 1	April 16-24	9	101-24			73.38	79	
Trip 2	May 8-23	16	101-0			61.75	94	
Trip 3	May 30- June 5	7	104-0			68.83	63	
Totals		22				203.96	236	24

[1] Total Number of pikeminnow captured includes recaptures.
[2] Recaptured fish include those handled on previous sampling passes in 2001.